

CLARK FORK HATCHERY
ANNUAL REPORT

INTRODUCTION

The Clark Fork Hatchery is a license-funded resident species "specialty" station located 1.5 miles northwest of Clark Fork, Idaho. Fish reared and stocked during the year totaled 2,276,653 (25,379 lbs) and consisted of 14 species and strains of fish stocked in Region 1 (Table 1). Over 45,000 westslope cutthroat are maintained on station as broodstock. Fish traps are operated to take kokanee and Kamloops eggs from naturalized populations in Region 1. Additional eggs and fish are received from federal, state, and private sources. Rearing units include Heath incubator stacks, concrete and fiberglass early rearing vats, concrete raceways, and earthen broodstock raceways. Water is diverted from Spring Creek for incubation and rearing, providing 8 to 15 cfs, at temperatures averaging 41°F in winter and 48°F in summer. A well provides approximately 100 gpm of 45°F water to one bank of incubators and the fiberglass troughs to mix with Spring Creek water.

HATCHERY IMPROVEMENTS

A production well was drilled and test-pumped this year. Water available was over 900 gpm at 44°F. At the completion of testing, the well was capped awaiting further funding for pump, piping, and installation.

Construction of a separate chemical storage room was completed in the hatchery building. The room was fully insulated and has electric heat. Formalin is now stored in a hooded enclosure with a vent fan exhausting noxious fumes outside of the work area.

PUBLIC RELATIONS

There were over 3,000 visitors at the hatchery this year, including public school tour groups from Clark Fork, Hope, and Sandpoint.

Considerable time was spent working with the Lake Pend Oreille Idaho Club, Metropolitan Mortgage and Securities Inc., Trout Unlimited, and Washington Water Power in developing a net pen rearing project for westslope cutthroat on Lake Pend Oreille. The purchase, construction, and operation of the project primarily utilized non-departmental resources. Rearing would start in October 1989.

The stocking of 189,000 westslope cutthroat unfed fry into tributaries to Priest Lake was a cooperative effort with the US Forest Service, Idaho Department of Fish and Game (IDFG), and the Priest Lake Sportsmen's Association. Participants were optimistic and pleased to assist the Department in any way.

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Table 1. Fish requested and produced, October 1, 1988 to September 30, 1989.

Species/size	Production goal	Number produced	Pounds produced	Percent of goal
brown BN/1	62,500	70,673	163.17	113%
brook BK/1	21,000	13,100	18.71	62%
cutthroat C2/1	291,000 ^a	448,477	313.00	154%
cutthroat C2/2	150,000	271,288	22,025.00	181%
Kamloops K1/1	328,000	121,005	248.00	37%(121%) ^b
Kamloops K2/2	20,000	13,351	234.00	67%
kokanee KE	0	191,752	2,807.50	none
kokanee KL/1	3,113,100	1,062,293	1,850.22	34%
rainbow R4/3	127,250	117,071		92%
rainbow R5/1	0	90,658	192.00	^b
rainbow R7/1	0	185,808	334.50	^b

^anumber reflects removal of C2 fry designated for stocking in Washington State.

^bK1, R5, and R7 all used to meet the K1 requirement.

Mountain lake stocking was also a cooperative effort, with the Boundary Backpackers of Bonners Ferry and Region 1 personnel stocking two-thirds of the lakes. Media coverage in both Idaho and Washington was excellent.

A 3 ft x 5 ft display case with a map of the Clark Fork Hatchery stocking area was installed in the visitor's center. The map is marked to indicate plant sites, species, stocking frequency, plus size and numbers of fish for the Clark Fork area.

FISH PRODUCTION

Fish production at the Clark Fork Hatchery changed substantially since the last production year. During 1988-1989, a total of 2,276,653 fish weighing 25,378 pounds (Table 1) were stocked from local production, versus 3,523,060 fish at only 12,000 pounds in 1987-1988. This visibly reflects the redirection of effort towards larger cutthroat and away from high numbers of very small cutthroat and kokanee. The cost per pound of fish produced was reduced by more than 50%.

Eggs received come from a variety of sources including state, federal, and private sources, as well as trapping of naturalized fish (Table 2). The majority of fish are released within six months of receipt, with only the wild Kamloops (K2) and westslope cutthroat retained past the fry stage. Kamloops (K2) egg collection in Spring Creek was four times the 1988 take, while kokanee (KL) eggs came only from the Coeur d'Alene Lake traps, reducing reared kokanee by 50%.

Fry were stocked in over 20 lowland lakes and streams by truck, and packed or flown to another 22 mountain lakes. Cutthroat "button-up" fry were delivered to tributaries on the west side of Priest Lake. For this project, only 189,000 fry were required this year, leaving the excess to stock in Spring Creek and Sand Creek. Of the fry listed in Table 3, 529,539 Clark Fork stock westslope cutthroat were held over for further rearing. All Fish Lake stock westslope cutthroat, and their 1989 progeny, were removed from the hatchery as they were deemed genetically less desirable than the Clark Fork stock.

Brood Year 1988 Kamloops (K2) were released in July; 6,500 at the hatchery and 6,851 in the Clark Fork River at the mouth of Lightning Creek. The Spring Creek release was adipose/left ventral-clipped, while the Clark Fork River group was adipose/right ventral-clipped. The 1989 Kamloops (K2) production was very successful, with 64,999 two-inch plus fry held for release in 1990 (Table 3). Growth has been good, with length at the end of the year 22% greater than in 1988.

The production of 280,582 two-year-old cutthroat (Table 4) exceeded regional stocking requirements by 80% (Table 1). Priest Lake received some of that excess as 54,500 adipose-clipped Clark Fork stock westslope cutthroat, released at four different sites in the south half of the lake. The fish ranged in size from 6.2 to 9.1 inches. The remainder were stocked into Hayden Lake.

Table 2. Eggs received and survival to feeding fry, October 1, 1988 to September 30, 1989.

Species/strain	Date received	Source	Number	Percent hatch	Destination	Release date
brook BK TemiscXRome	12/88	Brandon Ent.	37,312	99%	Region 1	6/89
brown BN	12/88	Twin Cr, ID	6,474	98%	Twin Creek	10/89
brown BN	12/88	Saratoga NFH	86,830	91%	Region 1	6/89
cutthroat C2 Clark Fk	5/89	broodstock	1,773,98	44%	Region 1	89-91
cutthroat C2 Fish	5/89	broodstock	809,117	37%	Region 1	8/89
Kamloops KM	2-3/89	Ennis NFH	182,824	75%	Hayden Lake	6/89
Kamloops K1	3/89	Skane's	30,000	84%	Mtn Lakes	8/89
Kamloops K2 Pend	4/89	Spring Cr, ID	97,057	90%	Spring	5/90
kokanee KL CdA	11-12/88	CdA Lake	1,570,017	85%	Priest Lk	7/89
rainbow R5	1/89	Ennis NFH	109,830	90%	Region 1	6/89
rainbow R7	2/89	Ennis NFH	308,803	66%	Hayden Lake	6/89

Table 3. Fry production and survival to release, October 1, 1988 to September 30, 1989.

Species	Source	Eyed eggs	Fry stocked/ transferred	Percent survival to stocking/ transfer	Cost (to nearest \$1,000)
					\$ 1,000
brook BK	Brandon	37,312	13,100	35%	
brown BN	Saratoga NFH	86,830	66,515	77%	\$ 3,000
brown BN TwCr	Twin Creek	6,474	4,158	64%	\$ 1,000
cutthroat C2	broodstock	1,625,962	994,775	61%	\$55,000
Kamloops K1	Ennis/Skane	212,824	121,005	57%	\$ 5,000
Kamloops K2	Spring Cr	92,204	64,999	70%	\$ 4,000
kokanee KL	CdA Lake	1,432,612	1,062,29	74%	\$25,000
rainbow R5	Ennis NFH	109,830	90,658	83%	\$ 8,000
rainbow R7	Ennis NFH	308,803	185,808	60%	\$10,000

Table 4. Subcatchable cutthroat production, October 1, 1988 to September 30, 1989.

Number on hand 10/1/88	Pounds on hand 10/1/88	Number stocked or transferred	Pounds stocked or transferred	Percent survival	Cost
369,707	11,907	280,582	23,398	76%	\$21,000

Broodstock replacement fish numbered 9,294 when transferred to brood ponds in September, and averaged 7.5 inches, or 36% larger, than the broodstock replacements of the same age from 1988.

REDISTRIBUTION

In addition to production of fry and fingerlings, the Clark Fork Hatchery has the responsibility for redistribution of fish north of Coeur d'Alene in, Region 1. Catchable size (Size 3) rainbow trout are received by tanker from state hatcheries in southern Idaho, held, and then stocked from April through October. The number of trout stocked (Table 5) should be spread evenly over the season, and could easily result in numerous trips with less than maximum loads. By combining several stocking sites for each trip and weighing-out fish rather than dumping whole compartments, costs were kept at a minimum (28% reduction from 1988).

Kokanee (KE) of the early spawning stock were transferred to the Clark Fork Hatchery from the Mackay Hatchery for holding and release into Priest Lake. All but one load were hauled in one trip using two borrowed anadromous hatcheries 2,100-gallon smolt tankers. By comparison, the Coeur d'Alene kokanee (KL), which were hauled in the hatchery 1,000-gallon tanker, took another two weeks to deliver, although the total weight was much less (Table 1).

Although never on station, tiger muskies (TM) were hauled from Hagerman Hatchery and released at six lake and river sites.

SPAWNTAKING

The transfer of responsibility for the Sullivan Springs kokanee trap from the Clark Fork Hatchery to the Cabinet Gorge Hatchery occurred in the fall of 1988. Cabinet Gorge had been the major destination for eggs taken at Sullivan Springs for several years, and this was the final step in shifting accountability.

The Kamloops (K2) run into Spring Creek in April 1989 was much larger than expected. In previous years, the Spring Creek run has been so weak that considerable time was spent trolling for adults in the Clark Fork River to acquire even minimal egg numbers. In 1989, 24 females and 13 males were collected in Spring Creek and 1 female and 1 male in the Clark Fork River (Table 6). Seventeen females were spawned to collect 97,057 eggs. The trapping operation was discontinued at that point and remaining adults left to spawn naturally in the channel. An estimated 10 to 20 adults were in the channel when trapping ceased.

Cutthroat spawning commenced in late April, immediately after Kamloops spawning, and was completed during May. The average fecundity of both the Clark Fork and Fish Lake stocks (Table 7) increased by over 25% this year, as five-

Table 5. Fish redistribution, October 1, 1988 to September 30, 1989.

Species/size	Source	Number	Cost	Cost per fish
rainbow R4,R8/3	American Falls SFH, Nampa SFH, Grace SFH	117,071	\$5,600	\$0.05
kokanee KE/2	Mackay	191,752	\$ 500	\$0.003

Table 6. Kamloops trapping, hook and line capture, and spawning at Clark Fork Hatchery 1989.

Date	Trap	Catch	Release	On hand	Spawn	Eggs
3/27		1M		1M		
4/5	2F		1F	1F 1M		
4/10	4F	1F	1F	5F 1M	1F	1,684
4/11	10F 6M		1F	14F 7M		1,684
4/12					9F	35,906
4/14	6F 4M		8F 4M	12F 7M	2f ^a	44,778
4/17			3F	9F 7M	3F	68,601
4/18	2F 3M			11F 10M		68,601
4/21			3F	8F	2F 2f ^a	84,157
4/24			4F	4F 10M	2F 1f ^a	97,057
Total	24F 13M	1F 1M	21F 4M		17F 5f ^a	97,057

^aindicates partial spawn

Table 7. Spawning summary, Clark Fork hatchery 1989.

Species	Eggs taken	Number of females	Eggs per female	Eyed eggs	Percent Eye-up	Cost
cutthroat C2 Clark Fork	1,773,983	4,621	384	1,229,861	69%	\$8,179
cutthroat C2 Fish Lake	809,117	1,117	724	396,090	49%	included in C2 Clark Fork cost
Kamloops K2	97057	17	5,709	92,204	95%	\$ 700

year-old adults were included in the brood population. In an attempt to improve eye-up in westslope cutthroat, which has been typically very poor, two modifications to egg handling were implemented. First, use of a .75% saline solution diluent was attempted, but its application was probably superfluous in the spawning procedure used for cutthroat. Secondly, the iodophor disinfection solution of 100 ppm Argentyne was buffered with sodium bicarbonate at 3.7 grams per gallon. Typically, eggs water-hardened in Spring Creek water are disinfected for 10 minutes in this iodophor solution before being placed in the Heathⁱⁿ incubator stacks. Hatchery personnel indicated that in past years, a largeⁱ increase in dead eggs was observed following this disinfection. Although space^{con} constraint prevented scientific method in evaluating these techniques, eye-up Percentage was improved in both stocks of westslope cutthroat. Cumulative average eye-up in 1988 was 44% for Fish Lake eggs and 59% for Clark Fork eggs, while in 1989 it was 49% for Fish Lake eggs and 69% for Clark Fork eggs.

FISH HEALTH

Broodstock disease inspections were made on Coeur d'Alene kokanee (KL), Spring Creek Kamloops (K2), and Clark Fork Hatchery broodfish (Table 8). Both the on-station broodfish as well as the Spring Creek Kamloops were positive for Bacterial Kidney Disease (BKD). The wild Kamloops (K2) were also found to be^positive for Infectious Pancreatic Necrosis Virus (IPNV). These diseases are resident in this drainage, but had not been isolated from the Kamloops (K2) adults in the past.

A sample of Upper Priest Lake westslope cutthroat was taken in June. Those fish are the only genetically pure adfluvial westslope cutthroat presently identified, and may be desirable as broodstock in the future. The sampled fish were disease free.

The samples taken of 1987 and 1988 hatchery cutthroat broodstock were^positive for BKD in the 1987 lot but negative for the 1988 lot. Although the samples were negative, substantial losses (2% during June and July) occurred in this group of Fish Lake 1988 fish when transferred to the long raceways. Outward Physical symptoms indicated BKD, and the group was placed on a 21-day treatment with erythromycin. Mortalities dropped below 0.01%/month following treatment.

An unusually high mortality occurred in the brook trout during May. Fish exhibited IPN symptoms but, when evaluated in June, were negative for viral pathogens. This loss was over 50% of the population (Table 1).

Resident brook trout from the headrace above the long raceways were captured and examined by IDFG pathologists. These fish were negative for bacterial and viral pathogens.

Broodstock aged five and six years were lost in great numbers (>50%) during and after spawning. This was the first time that westslope cutthroat adults had been held to that age, and their response to the stress was poor. Skin

Table 8. Fish health report for Clark Fork hatchery, October 1, 1988 to September 30, 1989.

Date	Accession	Species/lot	Diagnosis	Remarks
12/16/88	88-171	KL-CdA BdYr88	negative for disease agents	Annual brood inspection for Coeur d'Alene lake fish
4/16/89	89-61	K2-Spring Cr	positive for IPN and BKD	Ovarian fluid samples, no tissue collected
4/18/89	89-62	C2 broodstock-all	positive for BKD	BKD in all brood ponds, negative for viral pathogens
4/18/89	89-63	C2 Brood Yr 1987	positive for BKD	
4/19/89	89-68	C2 Brood Yr 1988	negative	Inspection negative for both viral pathogens and BKD
6/9/89	89-93	C2 Upper Priest Lk	negative	Fish obtained through hook and line collection
6/9/89	89-94	BK Brandon TemiscamieXRome	negative	Fish sample initiated by extremely high mortality exhibiting symptoms of viral infection
6/8/89	89-97	BK naturalized Spring Cr population	negative	Fish captured from headrace above long raceways

deteriorization with fungal infestation was very evident, although actual cause of death was not quantified.

SPECIAL PROJECTS

Fish Tagging Operations

The hatchery crew took part in tagging three different groups of fish for regional monitoring programs.

To better identify wild Kamloops (K2) found in spawning populations and the sportsmen's creel, 13,351 fish were clipped and released in Spring Creek and the Clark Fork River. Spring Creek releases had adipose and left ventral fins removed, while Clark Fork River releases had adipose and right ventral fins removed.

A tagging crew was hired, and they adipose fin-clipped 54,500 two-year-old Clark Fork stock westslope cutthroat for release into Priest Lake.

Hatchery personnel adipose fin-clipped 30,000 westslope cutthroat for rearing in three net pens on Lake Pend Oreille.

Feed/Density Evaluation

In an attempt to improve growth rates this past year, a limited test was initiated in four 16.6 cubic foot fiberglass troughs with westslope cutthroat. Troughs 9, 10, 11, and 12 were loaded at a density index (DI) of 1.7 ($DI = \text{weight/volume} \times \text{length of fish in inches}$), being representative of loading at the Clark Fork Hatchery. These fish were fed Rangen's soft- moist feed at a rate programed to yield 0.18 in/mo (Trough 9), 0.24 in/mo (Trough 10 and 12), and 0.30 in/mo (Trough 11). Troughs 9, 10, and 11 were hand fed, while Trough 12 was shielded with black plastic curtains and fed with automatic feeders to reduce flight response during feeding. Trough 6 was loaded at a DI of 0.3 as recommended by USFWS and hand fed at a rate to produce 0.24 in/mo growth. At the end of 51 days, fish were total-weighed and transferred to make room for incoming fry. The results seemed to indicate that there was no increase in growth above the 0.18 in/mo rate with increased feed rate alone, by reducing density, or by shielding the fish from disturbing movement. To increase growth above this rate will probably require introduction of warmer water.

Net Pens

A project was initiated this year to rear up to 100,000 westslope cutthroat in net pens on Lake Pend Oreille. Contacts were made with Metropolitan Mortgage and Securities Inc.; a Spokane, Washington firm which owns Harbor Marina on Garfield Bay. They offered to construct rails on unused boat moorage for two 20 ft x 20 ft pens. Construction was completed in July, and the first net purchased by the Clark Fork Hatchery installed, with fish to be loaded in October. Trout Unlimited personnel have volunteered to purchase feed, feed the fish, and care for the pens. During August, Washington Water Power purchased two additional pens and three automatic feeders. One more pen was installed at Garfield Bay, with the other pen to operate at Bayview where the Lake Pend Oreille Idaho Club will assist. The pens will be loaded with 10,000 4- to 5-inch one-year-old westslope cutthroat at 0.03 lbs/cu ft. The trout will be fed a pelletized ration at a rate to produce 0.25 to 0.5 in/mo growth.

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